

REMARKS

Applicants appreciate the Examiner's thorough consideration provided the present application. Claims 4-20 are now present in the application. Claims 4 and 13 are independent. Reconsideration of this application is respectfully requested.

Claim Rejections Under 35 U.S.C. § 103

Claims 4-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the Applicants' Related Art disclosure, in view of Yates, U.S. Patent No. 6,350,322. This rejection is respectfully traversed.

A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

Independent claim 4 recites "introducing a pressurized gas into the vessel from above the objects to force the etching solution out of the vessel from below the objects"; "cleaning the objects by introducing a cleaning solution into the vessel from below the objects" and "draining the cleaning solution from the vessel from above the objects."

Independent claim 13 recites "forcing the etching solution out of the vessel from below the objects by introducing a pressurized gas into the vessel from above the objects"; "after the etching solution is forced out by the pressurized gas, cleaning the objects by introducing a cleaning solution into the vessel from below the objects" and "draining the cleaning solution from the vessel from above the objects."

The Examiner alleged that the Applicants' Related Art disclosure in FIG. 1 discloses each and every step of claims 4 and 13 except for "introducing a pressurized gas into the vessel from

above the objects to force the etching solution out of the vessel from below the objects” as recited in claim 4 and “forcing the etching solution out of the vessel from below the objects by introducing a pressurized gas into the vessel from above the objects” as recited in claim 13.

The Examiner has correctly acknowledged that Yates fails to teach draining etchant from the wet etching chamber by introducing a pressurized gas into the vessel from above the objects to force the etching solution out of the vessel from below the objects as recited in claims 4 and 13 (see Office Action, the paragraph bridging pages 4 and 5). However, the Examiner took the position that since Yates discloses draining the cleaning solution (DI water) from the gas etch chamber by displacing the DI water bath with a gas or a vapor from an effluent valve in the gas etch chamber below the semiconductor structure, it is obvious for one skilled in the art to drain the wet etchant using the same method as draining the DI water.

Applicants respectfully disagree with the Examiner’s position and present the arguments in the “Response to the Examiner’s Arguments” section hereinbelow. Even if, assuming *arguendo*, Yates disclosed draining etchant from the wet etching chamber by introducing a pressurized gas into the vessel from above the objects to force the etching solution out of the vessel from below the objects as recited in claims 4 and 13, modifying the Applicants’ Related Art disclosure in FIG. 1 with Yates’ teaching would still fail to teach “draining the cleaning solution from the vessel from above the objects” as recited in claims 4 and 13.

In particular, the Applicants’ Related Art disclosure in FIG. 1 discloses supplying the DI water from below the objects to push the mixture of the etching solution and the DI water out of the vessel from above the objects via 10d. The purpose of this step is to use DI water to drain the etching solution out of the vessel. However, by replacing this step with Yates’ teaching based on

the Examiner's position, it is *no longer necessary to use the DI water to drain the etching solution out of the vessel* from above the objects because the etching solution has already been drained out of vessel by the introduced gas. In other words, by replacing this step with Yates' teaching based on the Examiner's position, there is *no need to drain the DI water from above the objects*. Instead, the DI water will be drained from *below* the objects, as described in paragraph [0008] of the specification.

In addition, as mentioned, the Examiner also took the position that the etching solution and the DI water of Yates should be drained *in the same manner, i.e., from below* the objects (see Office Action, page 4, lines 10-13). Therefore, the Examiner's position makes it more evident that, by modifying the Applicants' Related Art disclosure with Yates' teaching, the DI water will be drained out of the vessel from *below* the objects. Accordingly, the combination of the Applicants' Related Art disclosure and Yates fails to teach "draining the cleaning solution from the vessel from above the objects" as recited in claims 4 and 13.

Response to the Examiner's Arguments

The Examiner correctly acknowledged that there is no description of how a wet etchant would be drained from the vessel. However, the Examiner relied on claim 23 of Yates, which recites "performing a chemical reaction wet etching upon said semiconductor structure within a single compartment of an at least substantially enclosed vessel" and "purging the single compartment of said vessel with a gas". Although Yates discloses that the inert gas is purged into the vessel, Yates discloses that the inert gas is used to avoid oxidation or other contamination incident to ambient air exposure that may occur *during and after rising* (see col. 5,

lines 4-8). However, Yates nowhere discloses using the gas to drain the wet etchant. Instead, Yates discloses that following the chemical treatment step (in which the aqueous HF is *discarded*; see col. 5, lines 26-28), a rinsing step is carried out by performing a DI water rinse in a treatment vessel (see col. 5, lines 30-33), and that the treatment vessel is flooded with an inert gas to create an inert atmosphere that is maintained during rising to avoid the unwanted oxidation (col. 5, lines 61-65). Therefore, it is clear that the inert gas is purged into the treatment vessel after the aqueous HF is *discarded*, not used to drain the aqueous HF.

In addition, as mentioned, the Examiner took the position that since Yates discloses draining the cleaning solution (DI water) from the gas etch chamber by displacing the DI water bath with a gas or a vapor from an effluent valve in the gas etch chamber below the semiconductor structure, it is obvious for one skilled in the art to drain the wet etchant using the same method as draining the DI water (see Office Action, page 4, lines 9-2; page 5, lines 8-13).

This conclusion is improper because the Examiner completely fails to provide any objective evidence supporting her allegation.

The mere fact that the prior art (related art) may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be suggested or taught by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1970). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Moreover, a showing of a suggestion, teaching, or motivation to combine the prior art references is an “essential evidentiary component of an obviousness holding.” C.R. Bard, Inc. v. M3 Sys. Inc., 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232(Fed. Cir. 1998). This showing must be clear and particular, and broad conclusory statements about the teaching of multiple references, standing alone, are not “evidence.” See In re Dembiczak, 175 F.3d 994 at 1000, 50 USPQ2d 1614 at 1617 (Fed. Cir. 1999).

To be proper, there must be actual evidence of a suggestion or motivation to modify a reference and the showing must be clear and particular. *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) abrogated on other grounds, in *In re Gartside*, 203 F.3d 1305, 53 USPQ2d 1769 (Fed. Cir. 2000); see also, *Smith Indus. Med. Sys. v. Vital Signs, Inc.*, 183 F.3d 1347, 1356, 51 USPQ2d 1415, 1421 (Fed. Cir. 1999) (“That knowledge *may* have been within the province of the ordinary artisan does not in and of itself make it so, absent clear and convincing evidence of t knowledge.”) (emphasis in original); see *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Moreover, a factual inquiry whether to modify a reference must be based on objective evidence of record, not merely conclusory statements of the Examiner. See, In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002).

Here, Yates merely focuses on the DI water rinsing process after the chemical treatment and does not discuss any wet etching treatment or draining process. In particular, Yates in col. 6, lines 26-30 discloses that the chemical treatment, such as wet or dry etching, may be carried out and *following the chemical treatment, a DI water rinse followed by drying is carried out*. Yates in FIGs. 5 and 6 and col. 8, lines 6-48 also discloses that *after the chemical treatment*, the DI

water flows from the bottom (FIG. 5) or the side (FIG. 6) of the rinser 40/42 and overflows out of the rinser 40/42 at the right exit. However, Yates nowhere teaches how the *etching solution* is drained out of the rinser 40/42, and therefore fails to teach “introducing a pressurized gas into the vessel from above the objects to force the etching solution out of the vessel from below the objects” as recited in claim 4 and “forcing the etching solution out of the vessel from below the objects by introducing a pressurized gas into the vessel from above the objects” as recited claim 13.

In addition, the Examiner *admitted* that Yates fails to teach draining etchant from the wet etching chamber by introducing a pressurized gas into the vessel from above the objects to force the etching solution out of the vessel from below the objects as recited in claims 4 and 13 (see Office Action, page 4, lines 8-9 and 19-20; page 5, line 1). However, the Examiner made the statement that *since this feature is not disclosed by Yates*, it is *expected* that it would be drained in the same manner as the cleaning solution. Again, the Examiner simply made a conclusory statement without providing any reference to support her obviousness position and simply made unsupported assumptions which are not taught in Yates. Such hindsight reconstruction is not permissible. If the Examiner persists in her position, Applicants respectfully request that the Examiner provide the reference(s) to teach this feature.

Accordingly, neither the Applicants’ Related Art disclosure nor Yates individually or in combination teaches or suggests the above-noted features of independent claims 4 and 13. Therefore, Applicants respectfully submit that independent claims 4 and 13 and their dependent claims (due to their dependency) clearly define over the teachings of the Applicants’ Related Art

disclosure and Yates. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103 are respectfully requested.

CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

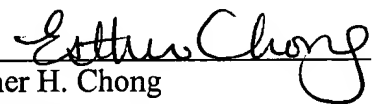
It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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